

SINGER

INSTRUMENTATION





**INSTRUCTION MANUAL
FOR
MODEL 95010-1
BROADBAND ROD ANTENNA
SERIAL NO. _____**

MANUAL NO. 1-500783-164

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WARRANTY

THE SINGER COMPANY, LOS ANGELES OPERATION, (SELLER) warrants each new instrument to be free from defects in material and workmanship, effective after delivery to the original purchaser as follows:

TCXO Oscillator 2 Years
Electrical and Electronic Measuring Instruments..... 1 Year

Repair or replacement (at our option) without charge (F.O B. factory) will be effected when our examination satisfactorily indicates that defects are due to workmanship or materials. Electron tubes, semiconductors, batteries, fuses, lamps, thermoelements, and RatioTran potentiometers are excluded from warranty coverage. Warranty returns must first be authorized by the factory.

If the instrument or any portion thereof, has been abused, misused, damaged by accident or negligence, or if any serial number or seal has been removed or altered, the warranty is void.

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With respect to repairs, the foregoing warranty shall apply for a period of ninety days to the repaired portion.

THE SINGER COMPANY, LOS ANGELES OPERATION
5340 Alla Road, Los Angeles, California 90066

REPAIR AND MAINTENANCE

Instruments should be returned only on prior authorization from the Singer Representative or the factory. You will be advised of detailed shipping instructions at that time. Return the instrument to the factory Prepaid. Validity of warranty will be determined by the factory.

Chargeable repairs: If requested, an estimate of charges will be made prior to repairs. Please provide us with the following information in order to expedite the processing of your instrument:

- | | |
|---|--|
| 1. Model or Type | 5. Approximate number of hours in use. |
| 2. Serial Number | 6. Has maintenance action been previously requested. |
| 3. Description of trouble ⁽¹⁾ | 7. Other comments. |
| 4. Approximate date instrument was placed in operation. | |

(1) Include data on symptoms, measurements taken, suspected location of trouble, maintenance action taken and any other relevant data.

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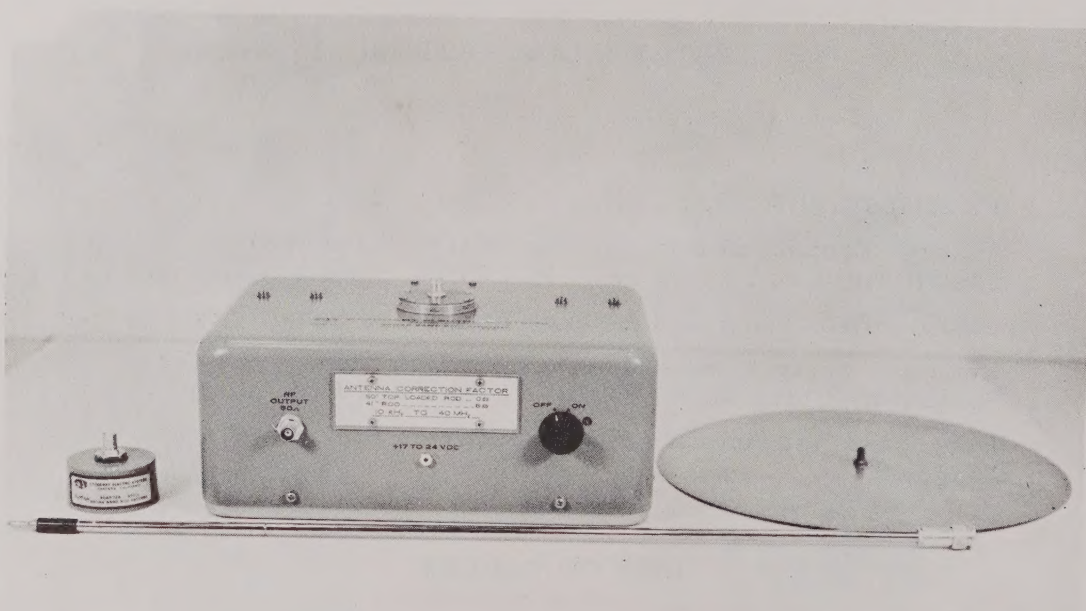
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FRONTISPIECE

SECTION 1

GENERAL INFORMATION

1.1 GENERAL DESCRIPTION

The Singer Model 95010-1 Broadband Rod Antenna operates over the frequency range of 10 kHz to 40 MHz, and may be used with any 50 ohm input RFI Meter or calibrated receiver to measure or detect extremely low level electric field radiated signals within that range. The complete Broadband Rod Antenna consists of a broadband high input impedance preamplifier, an adjustable rod antenna, a top loading disc and a 50 ohm input adapter. The overall dimensions are 12" $\times$ 10" $\times$ 6" and the unit weighs approximately ten (10) pounds with batteries. The antenna may be mounted on a standard tripod, if desired.

1.2 OPERATIONAL FEATURES

The Model 95010-1 Broadband Rod Antenna provides a wide operational bandwidth, covering the frequency range of 10 kHz to 40 MHz without bandswitching or tuning. The preamplifier is used to couple a signal from either a 0.5 or 1 meter effective height, high impedance rod antenna to a 50 ohm unbalanced receiver input without signal loss.

The top loaded, one meter effective height rod antenna is only 50 inches high. This low height feature permits its use in a shielded room where a standard 82 inch one meter rod could not be used.

When the top loaded one meter effective height antenna is used with the preamplifier, a sensitivity improvement of from 14 to 26 dB is obtained over that achieved by using a passive 41 inch rod antenna. When the 41 inch 0.5 meter rod antenna is used with the preamplifier, an improvement of 6 to 20 dB is obtained over that achieved by using a passive 41 inch rod antenna.

Direct substitution measurements may be performed by use of the 95011-1 50 ohm input adapter.

By use of a Singer 92192-3 Antenna Coupler Adapter, (not supplied) on the preamplifier input; the unit may be used as a high input impedance system in conjunction with a 50 ohm input receiver. Use of the preamplifier in this manner will provide an improvement in sensitivity of 6 to 20 dB over that obtained with a passive coupler system.

1.3 APPLICATIONS

The Model 95010-1 Broadband Rod Antenna may be used for a variety of applications where maximum sensitivity is required for detecting and measuring radiated fields over the frequency range of 10 kHz to 40 MHz. Due to its broad band characteristic, the unit is also useful when an automatic or swept frequency receiving system is used in performing measurements.

1.4 SPECIFICATIONS

Frequency Range	10 kHz to 40 MHz
Frequency Bands	One
Voltage Gain	0 dB $\pm$ 1 dB from 10 kHz to 25 kHz 0 dB $\pm$ 0.5 dB from 25 kHz to 40 MHz
Antenna Effective Height	50 inch top loaded rod: 1 meter 41 inch rod: 0.5 meter
Preamplifier Input Impedance	10 megohms shunted by 8 picofarads
Preamplifier Output Impedance	50 ohms
Antenna Correction Factor (for microvolts-per-meter)	50 inch top loaded rod: 0 dB 41 inch rod: 8 dB
Sensitivity	Dependent upon receiver bandwidth and frequency: Narrowband and broadband sensitivities are presented on Figures 1-1 and 1-2.

Maximum Signal
Input (overload)

One Meter Rod:

Narrowband: 107 dB μ V/m

Broadband: 73 dB μ V/m/MHz

41 inch Rod:

Narrowband: 115 dB μ V/m

Broadband: 81 dB μ V/m/MHz

Power Requirements

Battery, 24 volts. Requires 4 each,
Burgess type F-4BP or equivalent 6 volt
batteries. Batteries require replacement
when voltage is less than 17 volts.

Physical Size

12 inches wide $\times$ 10 inches deep $\times$ 6 inches
high.

Weight

Ten (10) pounds with batteries.

NOTE

The sensitivity data plotted is based on a signal + noise to noise ratio of 3 dB using the Model 95010-1 Broadband Rod Antenna with a receiver that has a 1 kHz random noise bandwidth. To calibrate the expected sensitivity using a receiver with a random noise bandwidth other than 1 kHz, a factor to be applied to the levels on Figure 1-1 may be calculated by the following formula:

$$\text{Factor (dB)} = 10 \log_{10} (\text{Receiver random noise bandwidth in kHz})$$

EXAMPLE

To determine the expected sensitivity at 100 kHz, using a receiver with a 100 Hz (0.1 Hz) bandwidth:

$$\text{Factor} = 10 \log_{10} 0.1 = -10 \text{ dB}$$

Sensitivity for a 1 kHz bandwidth receiver ($S_{1 \text{ kHz}}$) from Figure 1-1 at a signal frequency of 100 kHz = -10.5 dB μ V/m
Sensitivity to be expected with a 100 Hz bandwidth receiver ($S_{100 \text{ Hz}}$) would be:

$$S_{100 \text{ Hz}} = S_{1 \text{ kHz}} + \text{Factor} = -10.5 \text{ dB}\mu\text{V/m} + (-10 \text{ dB}) = -20.5 \text{ dB}\mu\text{V/m}$$

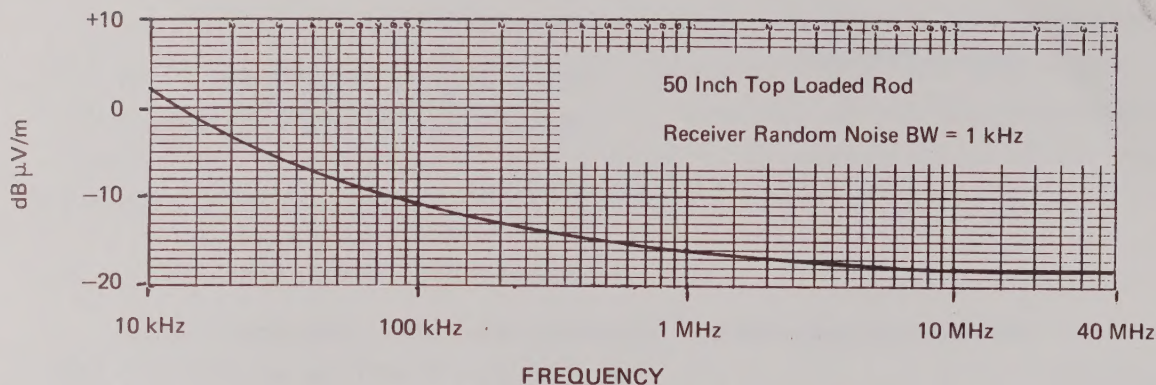


Figure 1-1. 95010-1 Broadband Rod Antenna,
Narrowband (cw) Sensitivity

NOTE

The sensitivity data plotted is based on a signal plus noise to noise ratio of 3 dB, using the Model 95010-1 Broadband Rod Antenna with a receiver that has a 1 kHz impulse bandwidth. To calculate the expected sensitivity using a receiver with an impulse bandwidth other than 1 kHz, a factor to be applied to the levels on Figure 1-2 may be calculated by the following formula:

$$\text{Factor (dB)} = 10 \log_{10} \left(\frac{1}{\text{Receiver impulse noise bandwidth in kHz}} \right)$$

EXAMPLE

To determine the expected sensitivity at 10 MHz, using a receiver with a 100 kHz bandwidth:

$$\text{Factor} = 10 \log_{10} \left(\frac{1}{100} \right) = 10 \log_{10} 0.01 = -20 \text{ dB}$$

Sensitivity for a 1 kHz bandwidth receiver (S_1 kHz) from Figure 1-2 at 10 MHz = +48 dBμV/m/MHz.

Sensitivity expected with a 100 kHz bandwidth receiver ($S_{100 \text{ kHz}}$) would be:

$$S_{100 \text{ kHz}} = S_{1 \text{ kHz}} + \text{Factor} = +48 + (-20) = +28 \text{ dB}\mu\text{V/m/MHz}.$$

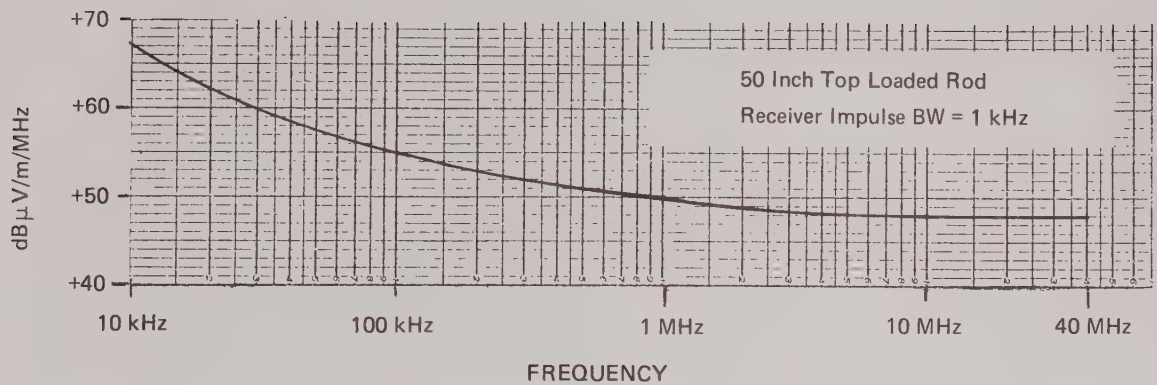


Figure 1-2. 95010-1 Broadband Rod Antenna,
Broadband Sensitivity

1.5 EQUIPMENT SUPPLIED

The items supplied as part of the Singer Model 95010-1 Broadband Rod Antenna are as follows:

<u>ITEM</u>	<u>SINGER NUMBER</u>	<u>DESCRIPTION</u>
1	95171-1	Rod Antenna Preamplifier
2	95011-1	50 ohm Input Adapter
3	94186-1	Top Hat Assembly
4	94185-1	Rod Antenna
5	---	Instruction Manual

1.6 ACCESSORIES AVAILABLE

The relevant accessory items available for use with the Singer Model 95010-1 Broadband Rod Antenna are as follows:

<u>ITEM</u>	<u>SINGER NUMBER</u>	<u>DESCRIPTION</u>
1	91933-2	Tripod
	92245-1	or Tripod, with pan and tilt head
2	92191-1	RF Transmission Line, 20 feet
3	92192-3	Coupler Adapter, Antenna

SECTION II

INSTALLATION

2.1 GENERAL

The Singer Model 95010-1 Broadband Rod Antenna consists of a preamplifier, a collapsible rod antenna and a top hat assembly. These parts must be assembled to form a complete operating unit as described in the following paragraphs. (See Figure 2-1).

2.2 ANTENNA ASSEMBLY

2.2.1 0.5 Meter Effective Height Rod Antenna. In the 0.5 meter effective height configuration, the 94185-1 Rod Antenna is extended to 41 inches. This is accomplished by using only the bottom two sections of the telescoping rod. The antenna correction factor for the 41 inch rod antenna is 8 dB.

2.2.2 One Meter Effective Height Rod Antenna. In the one meter effective height configuration, the 94185-1 Rod Antenna is extended to its full 50 inch length and the 94186-1 Top Hat assembly is installed. The antenna correction factor for the 50 inch top loaded antenna is 0 dB.

2.3 BATTERY INSTALLATION OR REPLACEMENT

To install or replace the four (4) 6-volt batteries, proceed as follows:

- a. Set the ON/OFF switch to OFF
- b. Remove the eight (8) 6-32 screws securing the bottom cover and remove the cover.
- c. Remove the two 1/4-20 knurled head screws securing the two battery clamps.

2.3 BATTERY INSTALLATION OR REPLACEMENT (Continued)

- d. Remove the eight (8) battery terminal caps, lift the battery clamps off of the battery terminals and remove the batteries.
- e. Remove the eight (8) battery terminal caps from the replacement batteries.
- f. Orient and install the batteries.
- g. Place the battery clamps on the batteries with the conductor side facing the batteries.
- h. Install the eight (8) battery terminal caps on the battery terminals and tighten securely.
- i. Secure the two (2) battery clamps with the 1/4-20 knurled head screws.
- j. Replace and secure the bottom cover.

SECTION III

OPERATION

3.1 GENERAL

This section contains information and procedures for use of the Model 95010-1 Broadband Rod Antenna in performing radiated electric field measurements.

3.2 OPERATION

3.2.1 Introduction. The Model 95010-1 Broadband Rod Antenna may be used with any 50 ohm input RFI Meter or calibrated receiver for the detection and measurement of radiated electric field over the frequency range of 10 kHz to 40 MHz. The measurement of the radiated field is accomplished by measuring the RF voltage output of the antenna unit and then applying an "Antenna Correction Factor" to this voltage to determine the RF field strength.

NOTE

In order to utilize the maximum sensitivity capability of the antenna unit, the receiver used with it must have a noise figure less than that shown by Figure 3-1. The following procedure may be used to determine if this condition is met:

1. Attach the 95011-1 50 ohm Input Adapter to the Preamplifier.
2. Connect the antenna unit RF output to the receiver RF Input.
3. With the antenna unit power OFF, observe the receiver's internal noise level.
4. Turn the antenna unit on the observe the increase in the noise level obtained in Step 3). The noise level should increase 8 dB or more.

- 5) Repeat Steps 3) and 4) at as many frequencies as necessary.

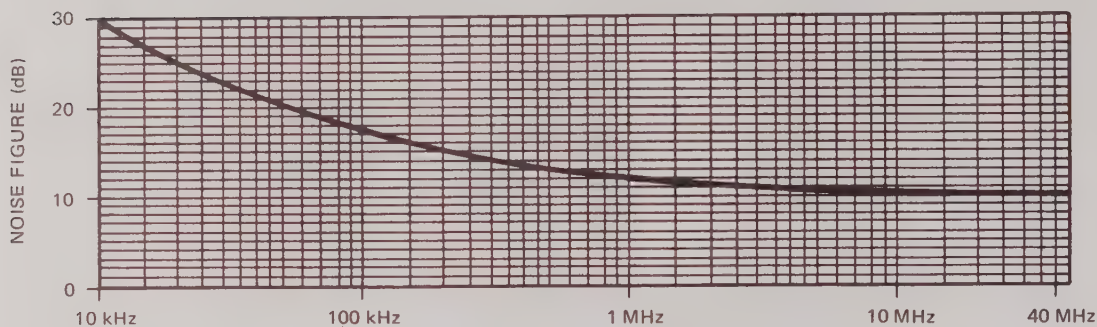


Figure 3-1. Receiver Noise Figure Required for Maximum Sensitivity Using Model 95010-1 Broadband Rod Antenna

3.2.2 Setup for Operation

- Turn the ON/OFF switch ON and check the battery voltage at the 17-24 volt test point. Satisfactory operation may be expected if the battery voltage is 17 volts or higher.
- Attach the 94185-1 Rod Antenna (and the 94186-1 Top Hat if appropriate) to the preamplifier input connector.
- Set the antenna unit in the desired location or as required by an applicable specification.
- Connect the antenna RF output to the receiver or RFI meter 50 ohm input.

3.2.3 Operation.

- a. Measure the antenna unit output voltage at the desired frequency with the receiver or RFI meter in either microvolts or dB related to one microvolt units.
- b. Apply the appropriate antenna factor from Table 3-1 to the reading obtained in Step a) to determine the radiated signal strength.

EXAMPLE

Assume the 41-inch rod antenna was used and the measured level obtained in Step a) was 10 μV (or 20 $\text{dB}\mu\text{V}$), then:

1. If the answer is desired in terms of decibels related to one microvolt-per-meter;

$$\text{dB}\mu\text{V}/\text{m} = 20 \text{ dB}\mu\text{V} + 8 \text{ dB} = 28 \text{ dB}\mu\text{V}/\text{m}$$

2. If the answer is desired in terms of microvolts-per-meter;

$$\mu\text{V}/\text{m} = 10 \mu\text{V} \times 2.5 = 25 \mu\text{V}/\text{m}$$

3. If the answer is desired in terms of decibels related to one microvolt antenna induced;

$$\text{dB}\mu\text{V} (\text{ind}) = 20 \text{ dB}\mu\text{V} + 2 \text{ dB} = 22 \text{ dB}\mu\text{V} (\text{ind})$$

NOTE

The procedure outlined above will also apply for performing broadband signal measurements. The level determined in Step a) should be in broadband terms and the radiated signal strength will also be in broadband terms, i. e., $\text{dB}\mu\text{V}/\text{m}/\text{MHz}$.

CAUTION

If the maximum signal input specified in Section I, Paragraph 1.4, is exceeded, erroneous measurements will result.

TABLE 3-1. 95010-1 BROADBAND ROD
ANTENNA CORRECTION FACTORS

Measurement Terminology	Correction Factors	
	50 Inch Top Loaded Rod	41 Inch Rod
Decibels related to one microvolt-per-meter ($\text{dB}\mu\text{V}/\text{m}$)	0 dB	8 dB
Microvolts-per-meter ($\mu\text{V}/\text{m}$)	1.0	2.5
Decibels related to one microvolt, antenna induced or "open circuit", ($\text{dB}\mu\text{V}$)	---	2 dB

SECTION IV

PRINCIPLES OF OPERATION

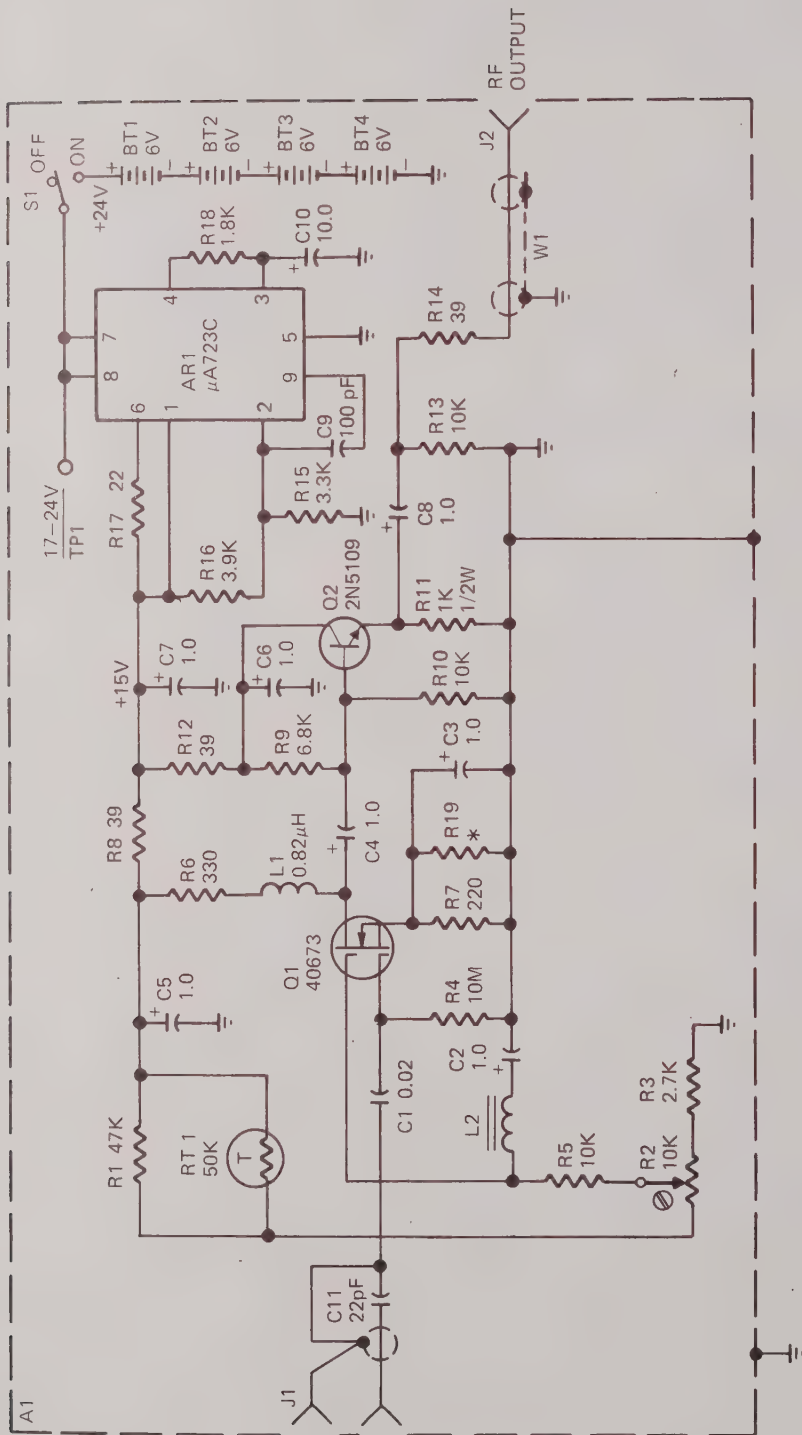
4.1 INTRODUCTION

This section contains a detailed description of the Model 95010-1 Broadband Rod Antenna that is intended as an aid in understanding the operation of the unit as well as providing an insight in troubleshooting should a fault occur.

4.2 DETAILED ANALYSIS (Refer to schematic, Figure 4-1)

4.2.1 Preamplifier (Unit A1). The preamplifier serves to match the high impedance of a rod antenna to the 50 ohm input of a receiver and to provide sufficient low noise amplification to establish the overall system sensitivity. The amplifier input impedance is 10 megohms shunted by approximately 8 picofarads. The voltage gain of the amplifier is essentially constant from 10 kHz to 40 MHz and is factory adjusted to a value of 0 dB at 10 MHz when operating with a 22 picofarad source and a 50 ohm termination on the output.

The preamplifier consists of a two-stage wideband amplifier employing an MOS field-effect-transistor (FET) voltage amplifier and an emitter follower output stage. The FET, Q1, is a dual-insulated-gate type featuring a very high input impedance and low internal noise. The gain of Q1 is adjusted by setting the Gate #2 bias with potentiometer, R2. A thermistor, RT1, in the bias circuit provides temperature compensation to stabilize the gain of the amplifier. L1 is a high-frequency peaking coil used to increase the amplifier bandwidth. A 22 picofarad capacitor, C11, is installed in the input circuit and acts as a "dummy antenna" impedance when calibrating the unit by use of the 95011-1 50 ohm input adapter.



NOTES:

1. ALL RESISTOR VALUES ARE IN OHMS UNLESS FOLLOWED BY "K" KILOHMS OR "M" MEGOHMS.
2. ALL CAPACITANCE VALUES ARE IN MICROFARADS UNLESS FOLLOWED BY "pF" PICO FARADS.

*3. R19 IS FACTORY SELECTED.

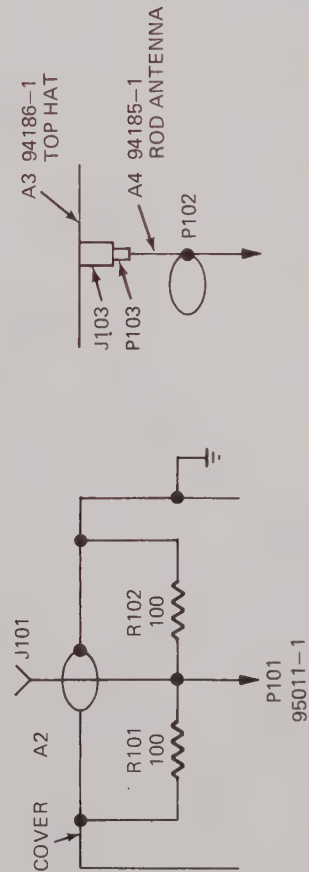


Figure 4-1. Broadband Rod Antenna and Accessories Schematic Diagram

The amplified signal from the drain of Q1 is applied to the emitter-follower, Q2, which provides current amplification and provides a 50 ohm output impedance.

Internal batteries supply power to the preamplifier with an integrated circuit voltage regulator, AR1, to stabilize the +15 volts applied to the amplifier circuitry. The voltage regulator also provides current limiting to protect the circuit from damage caused by an accidental short. A test point is available on the front of the unit to check the battery voltage. Normal operation can be expected as long as the battery voltage exceeds +17 volts. The operating life of the internal batteries is in excess of 200 hours under normal use conditions.

4.2.2 Rod Antenna and Top Hat (Units A3 and A4). When the Rod Antenna (94185-1) is fully extended to its 50 inch length and the capacitive loading "top hat" (94184-1) is installed, the antenna exhibits an effective height of one meter. For this condition, the radiation capacitance of the antenna is approximately 22 picofarads. When the top hat is removed and the top-most section of the rod is compressed to a physical length of 41 inches, the antenna exhibits an "effective height" of one-half meter and its radiation capacitance is approximately 12 picofarads.

The center pin of the rod antenna connector, P-102, has been removed. The rod antenna is connected to the preamplifier input, J-1, by use of the connector shell only which bypasses C11, the 22 pF "dummy antenna" capacitor.

4.2.3 50 Ohm Input Adapter (Unit A2). The 50 ohm input adapter is provided for use in calibrating the preamplifier or for performing "direct substitution" measurements. When the adapter is connected to the preamplifier and a signal is applied to the BNC connector, J101, the signal is fed to the preamplifier input connector, (J1), center conductor by way of P101 which connects the "dummy antenna" capacitor, C11, in series with the signal source. No connection is made to the shell of J1, however, the shell of the adapter is connected to the preamplifier case. Two 100 ohm resistors, R101 and R102, are connected in parallel across in input to provide a 50 ohm, 1/2 watt termination, for the signal source.

SECTION V

MAINTENANCE

5.1 GENERAL

The recommended maintenance procedures for the Model 95010-1 consist of periodic battery replacement, inspection, and operational check. The batteries should be replaced whenever the battery voltage falls below +17 volts measured at the panel test point. For normal conditions, the batteries will provide more than 200 hours of operational life. (See Section 2.3 for replacement procedure.) At the time the batteries are replaced, the unit should be inspected and cleaned if necessary. Be sure that no corrosive residue from the old batteries is present in the unit, and keep the battery contacts clean.

5.2 OPERATIONAL CHECK AND GAIN ADJUSTMENT

A periodic operational check is recommended for the Model 95010-1 to assure that the unit gain and frequency response are within the specified limits. A laboratory signal generator and an RF voltmeter is required for this check. The following instruments, or equivalent, are recommended:

RF Signal Generator, Hewlett-Packard Model 606A.

RF Voltmeter, Hewlett-Packard Model 411A.

Proceed as follows:

- a. Install the 50 ohm Input Adapter (95011-1) on the antenna unit and turn the POWER switch on. Check the battery voltage at the panel test point.
- b. Apply a 10 MHz RF signal at a level of -20 dBm to the 50 ohm Input Adapter.
- c. Connect the RF Voltmeter (with a 50 ohm probe termination) to the RF OUTPUT receptacle on the antenna unit.

- d. The indicated output on the RF voltmeter should be $-20 \text{ dBm} \pm 0.5 \text{ dB}$ corresponding to unity gain in the amplifier.
- e. In a similar manner, check the gain at other frequencies within the specified range of the unit as desired.
- f. If necessary, adjust potentiometer, R2, on the amplifier circuit board to obtain an average gain of $0 \text{ dB} \pm 0.5 \text{ dB}$ throughout the frequency range of 500 kHz to 40 MHz.
(If the unit meets the gain and frequency response through this range, it may be assumed that the unit will perform satisfactorily from 10 kHz to 40 MHz. A lower frequency signal generator and voltmeter are required to test the unit below 500 kHz.)

SECTION VI

REPLACEABLE PARTS

6.1 GENERAL

This section contains a list of all replaceable electrical parts for the Model 95010-1 Broadband Rod Antenna.

6.2 COMPONENT LOCATION

The reference symbol number for a particular component listed on the parts list also appears on the schematic, Figure 4-1, to assist in locating the component within the unit.

TABLE 6-1. MODEL 95010-1 BROADBAND ROD ANTENNA,
PARTS LIST (Refer to Figure 4-1)

Ref. Symbol	Description	SES No.	Mfg.'s Name	Mfg.'s Part No.
A1	AMPLIFIER ASSEMBLY: C/O electrical compo- nents mounted on a cir- cuit board, includes enclosure and cover, output cable assembly, W1	95171-1	Singer	95171-1
AR1	INTEGRATED CIRCUIT; μ A723C	12699	Fairchild	U5R7723393
BT1	BATTERY; 6V	12338	Burgess	F4BP
BT2	Same as BT1			
BT3	Same as BT1			
BT4	Same as BT1			
C1	CAPACITOR, FIXED CERAMIC; .02mF, 25vdc	12650	Erie	5835-000-Y5U-203Z
C2	CAPACITOR, FIXED, ELECTROLYTIC: 1mF, $\pm 10\%$, 35vdc	12468	Sprague	150D105X9035A2
C3	Same as C2			
C4	Same as C2			
C5	Same as C2			
C6	Same as C2			
C7	Same as C2			
C8	Same as C2			
C9	CAPACITOR, FIXED MICA; 100 pF $\pm 5\%$, 500 vdcw	11750- 101	Elmenco	DM10-101J
C10	CAPACITOR, FIXED ELECTROLYTIC; 10 mF, 10vdc	12559	Kemet	K-10-W-10

TABLE 6-1. MODEL 95010-1 BROADBAND ROD ANTENNA,
PARTS LIST (Continued)

Ref. Symbol	Description	SES No.	Mfg.'s Name	Mfg.'s Part No.
C11	CAPACITOR, FIXED MICA; 22 pF $\pm$ 5%, 500 vdc	11750- 220	Elmenco	DM10-220J
J1	CONNECTOR, RECEP- TACLE; TNC type bulkhead mtg (For Refer- ence only)	11662	Kings Elect.	KA-71-02
J2	CONNECTOR, RECEP- TACLE; BNC type bulk- head mtg. (Part of W1)	12366	Automatic Metals	025-B3600-7S
L1	COIL, RF; .82 μ H Inductor	12440- 0.82	Lenox Fugle	MCR-0.82
L2	RF CHOKE; (FERRITE BEAD)	12662	Ferrox- cube	56-590-65/4B
Q1	TRANSISTOR; field effect, dual gate	12698	RCA	40673
Q2	TRANSISTOR; NPN	2N5109	RCA	IN5109
R1	RESISTOR, FIXED COMPOSITION; 47000 ohms $\pm$ 5%, 1/4W	11693- 473	Allen- Bradley	CB-4735
R2	RESISTOR, VARIABLE; 10,000 ohms, 0.5W	18546- 103	Beckman	62P-R-103
R3	RESISTOR, FIXED COMPOSITION; 2,700 ohms $\pm$ 5%, 1/4W	11693- 272	Allen- Bradley	CB-2725
R4	RESISTOR, FIXED COM- POSITION; 10 megohms $\pm$ 5% 1/4W	11693- 106	Allen- Bradley	CB-1065
R5	RESISTOR, FIXED COM- POSITION; 10,000 ohms $\pm$ 5%, 1/4W	11693- 103	Allen- Bradley	CB-1035
R6	RESISTOR, FIXED COM- POSITION; 330 ohms $\pm$ 5%, 1/4W	11693- 331	Allen- Bradley	CB-3315
R7	RESISTOR, FIXED COM- POSITION, 220 ohms $\pm$ 5%, 1/4W	11693- 221	Allen- Bradley	CB-2215

TABLE 6-1. MODEL 95010-1 BROADBAND ROD ANTENNA,
PARTS LIST (Continued)

Ref. Symbol	Description	SES No.	Mfg.'s Name	Mfg.'s Part No.
R8	RESISTOR, FIXED COM- POSITION; 39 ohms $\pm 5\%$, 1/4W	11693- 390	Allen- Bradley	CB-3905
R9	RESISTOR, FIXED COM- POSITION; 6,800 ohms $\pm 5\%$, 1/4W	11693- 682	Allen- Bradley	CB-6825
R10	Same as R5			
R11	RESISTOR, FIXED COM- POSITION; 1,000 ohms $\pm 5\%$, 1/2W	10011- 102	Allen- Bradley	CB-1025
R12	Same as R8			
R13	Same as R5			
R14	Same as R8			
R15	RESISTOR, FIXED COM- POSITION, 3,000 ohms $\pm 5\%$, 1/4W	11693- 332	Allen- Bradley	CB-3325
R16	RESISTOR, FIXED COM- POSITION; 3,900 ohms $\pm 5\%$, 1/4W	11693- 392	Allen- Bradley	CB-3925
R17	RESISTOR, FIXED COM- POSITION; 22 ohms $\pm 5\%$, 1/4W	11693- 220	Allen- Bradley	CB-2205
R18	RESISTOR, FIXED COM- POSITION; 1,800 ohms $\pm 5\%$, 1/4W	11693- 182	Allen Bradley	CB-1825
R19	RESISTOR (FACTORY SELECTED VALUE)			
RT1	THERMISTOR; 50K ohms	12700	GE	4D103
S1	SWITCH, ROTARY; 1 pole, 2 position	12697	Singer	12697

TABLE 6-1. MODEL 95010-1 BROADBAND ROD ANTENNA,
PARTS LIST (Continued)

Ref. Symbol	Description	SES No.	Mfg. 's Name	Mfg. 's Part No.
TP1	TEST POINT	12365	EF Johnson	105-251-1
W1	CABLE ASSEMBLY, RF; coaxial cable RG- 188/U terminated on one end with termina- tion and connector, J2, other end	94329- 14	Singer	94329-14
A2	INPUT ADAPTER; 50 ohm	95011-1	Singer	95011-1
J101	CONNECTOR, RECEP- TACLE; modified UG- 911A/U	53187	Singer	51387
P101	CONNECTOR, CENTER, PIN	53186	Singer	51386
R101	RESISTOR, FIXED COM- POSITION; 100 ohms $\pm 5\%$, 1/4w	11693- 101	Allen- Bradley	CB-1015
R102	Same as R101			
A3	TOP HAT ASSEMBLY	94186-1	Singer	94186-1
J103	BANANA JACK; (part of A3 assembly)	12412	H. H. Smith	No. 109
A4	ROD ANTENNA; tele- scoping type, 50 in. extended length	94185-1	Singer	94185-1
P102	For Reference Only, Part of A4			
P-103	For Reference Only, Part of A4			

ADDENDUM #1 TO
MANUAL #1-500783-164
BROADBAND ROD ANTENNA
MODEL 95010-1

Errata

1. Paragraph 4.2.2 (Page 15)

Delete all of paragraph 4.2.2 and replace with the following:

4.2.2 Rod Antenna and Top Hat (Units A3 and A4)

When the Rod Antenna (94185-1) is fully extended to its 50 inch length and the capacitive loading "top hat" (94184-1) is installed, the antenna exhibits an effective height of one meter. For this condition, the radiation capacitance of the antenna is approximately 22 picofarads. When the top hat is removed and the topmost section of the rod is compressed to a physical length of 41 inches, the antenna exhibits an "effective height" of one-half meter and its radiation capacitance is approximately 12 picofarads.

The center pin of the rod antenna connector, P-102, has been removed. The rod antenna is connected to the preamplifier input, J-1, by use of the connector shell only which bypasses C11, the 22pf "dummy antenna" capacitor.

2. Paragraph 5.2(b) (Page 17)

Paragraph 5.2(b) should read "Apply a 10 MHz RF signal at a level of -20 dBm to the 50 ohm input adapter".

3. Paragraph 5.2(d) (Page 18)

Paragraph 5.2(d) should read "The indicated output of the RF voltmeter should be -20 dBm ± 0.5 dB corresponding to unity gain in the amplifier".

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